single domain behaviour even in the demagnetized state, while modulated ones -with increased hardness- show the presence of domain walls. Micromagnetic simulations [2] predict the magnetization to point along the wire main axis in both cases although two kinds of stable domain walls are expected for the modulated wires.

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Donor-acceptor Interactions At Solid Surfaces Controlled By Charge Transfer

Koen Lauwaet[1], J. Rodríguez-Fernández[2], R. García[3], M. A. Herranz[3], N. Martín[1,3], J. M. Gallego[1,4], R. Otero[1,2], R. Miranda[1,2]

[1] IMDEA-Nanociencia. Madrid. [2] Universidad Autónoma de Madrid. Madrid. [3] Universidad Complutense de Madrid. Madrid. [4] ICMM-CSIC. Madrid.

Organic charge-transfer (CT) complexes are molecular compounds mixing two species with different electron affinities: an electron donor (D) and an electron acceptor (A). Charge transfer processes between D–A complexes and metallic electrodes are at the heart of novel organic optoelectronic devices such as solar cells [1]. In contrast with the existing exhaustive study of the bulk properties of CT solids, very little is known about the thinfilm behaviour. The transition from bulk D-A complexes to ultra-thin films of monolayer thickness deposited on metals introduces a new phenomenology related to the organic– inorganic interface [2]. Effects like hybridization, CT with the surface and molecular level alignment become factors that may govern the electronic transport. Hence, the adsorption of an ultra-thin D–A layer on a metal opens a new field of research for the potential application of CT complexes as devices in the nanoscale. Simultaneous characterization of the interdependent structural and electronic properties is required for a thorough understanding of the D-A complexes under study [3]. Here, by combining both Scanning Tunnelling Microscopy (STM) and X-ray Photoelectron Spectroscopy (XPS) in situ, we can study the delicate balance that exists between intermolecular and molecule–substrate interactions, as well as the hybridization, and the charge transfer taking place in model donor–acceptor assemblies at metal-organic interfaces. By controlling the stoichiometry between tetrathiafulvalene (TTF, electron-donor) and tetracyanoethylene (TCNE, electronacceptor), we can tune both the structural and the electronic properties of a donor-acceptor system on Ag(111). We show that this system exhibits various structural phases, depending on the stoichiometry, each leading to different levels of charge transfer. Interestingly enough, the charge-transfer does not seem to follow a monotonic behavior with the D:A ratio. These results demonstrate that atomistic studies on the growth of organic thin films under ultrahigh vacuum (UHV) conditions can lead to the kind of accurate control needed in order to optimize device characteristics.

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Local Electrical Properties Of Double Terminated La0.7Sr0.3MnO3 Films

Laura López-Mir[1], José Cisneros[1], Carmen Ocal[1], Lluís Balcells[1], Benjamín Martínez[1], Laura López-Mir[1]

[1] Institut de Ciència de Materials de Barcelona, ICMAB - CSIC, Campus UAB, 08193 Bellaterra, Spain

La0.7Sr0.3MnO3 (LSMO) thin films were grown using sputtering technique onto STO substrates initially exhibiting either SrO or TiO2 single chemical termination or a mixture of both. A combination of tapping mode atomic force microscopy (AFM) and conductive AFM (CS-AFM) has been used to study the topography and the electric properties of the films. Though the deposited films are expected to grow following the stacking sequence of the substrate [1], all obtained LSMO films presented bimodal conducting properties typical of double terminated films, therefore indicating that the substrate termination has not been replicated at the thin film surface in our case. The possible influence of surface termination on the electrical properties of the films and the local induced resistive switching [2] using the AFM tip as top electrode has been explored. Finally, as resistive switching is crucially dependent on the electrode-film interface; several AFM probes with different conductive coatings have been used to study the influence of the current sensing tool in this phenomenon

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The Mode Of Growth And Magnetic Properties Of Ultrathin Co Films Grown On The Curved Pd(111) And Curved Ni(111)

A. Magaña[1], M. Ilyn[2], L. Fernández[3], J. E. Ortega[1,2,3], F. Schiller[2]

[1] Departamento de Fisica Aplicada I, Universidad del Pais Vasco, E-20018 Donostia-San Sebastian, Spain [2] Centro de Fisica de Materiales (CSIC-UPV-EHU) and Materials Physics Center (MPC), E-20018 Donostia-San Sebastian, Spain [3] Donostia International Physics Center, E-20018 Donostia-San Sebastian, Spain

Ultrathin Co films grown epitaxially on Pd(111) and Ni(111) demonstrate out-of-plane (OOP) magnetic anisotropy due to the strong interfacial effects. These materials were found to be useful for applications in spin-torque devices and bit-patterned magnetic media. Furthermore it is a suitable playground to study the interplay between the crystal structure, electronic and magnetic properties of the interfaces [1]. Though the mode of growth and magnetism of Co films have been thoroughly studied for flat Pd(111) and Ni(111), these properties are less investigated when the substrate is comprised by vicinal surfaces of these single crystals.